

09/449,773-

cog



PATENT
13DV13092

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 7,020,595

Issued: March 28, 2006

Inventor(s): Adibhatla et al.

Assignee: General Electric Company

For: METHODS AND APPARATUS FOR
MODEL BASED DIAGNOSTICS

Certificate
OCT 11 2007
of Correction

CERTIFICATE OF MAILING

I certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on October 5, 2007.

Robert B. Reeder, III
Reg. No. 455,548

Attention Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION OF
PATENT UNDER 37 C.F.R. 1.322(a)

Sir:

Attached is Form PTO/SB/44 suitable for printing.

Submitted herewith is a copy of the Notice of Allowance and Fee(s) Due and the Notice of Allowability dated December 13, 2005 and a copy of the Amendment filed September 14, 2005. Applicants respectfully submit that the corrections shown below are in accordance with the Amendment filed September 14, 2005. The corrections thereof do not involve such changes in the patent as would constitute new matter or would require re-examination. Applicants respectfully request a Certificate of Correction for the following:

In Claim 13, column 6, beginning on line 38, between "the" and "component" insert -
- engine --.

OCT 11 2007

In Claim 15, column 6, line 54, delete "delta--delta" and insert therefor -- delta-delta--

In Claim 16, column 6, line 62, delete "delta--delta" and insert therefor -- delta-delta--

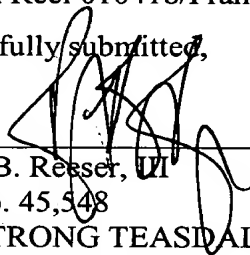
The corrections are not due to any error by Applicants and no fee is due.

The Assignment for this patent is recorded on Reel 010418/Frame 0117.

Date: _____

09/15/07

Respectfully submitted,



Robert B. Reaser, UI
Reg. No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070

OCT 11 2007

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

PATENT NO. : 7,020,595
APPLICATION NO. : 09/449,773
ISSUE DATE : March 28, 2006
INVENTOR(S) : Adibhatla et al.

PAGE 1 OF 1

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Claim 13, column 6, beginning on line 38, between "the" and "component" insert -- engine

--.

In Claim 15, column 6, line 54, delete "delta--delta" and insert therefor -- delta-delta--.

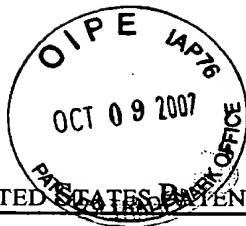
In Claim 16, column 6, line 62, delete "delta--delta" and insert therefor -- delta-delta--.

MAILING ADDRESS OF SENDER:

Robert B. Reeser, III
Armstrong Teasdale LLP
One Metropolitan Sq., Suite 2600
St. Louis, MO 63102

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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NOTICE OF ALLOWANCE AND FEE(S) DUE

29399 7590 12/13/2005

JOHN S. BEULICK
C/O ARMSTRONG TEASDALE LLP
ONE METROPOLITAN SQUARE
SUITE 2600
ST. LOUIS, MO 63102-2740

EXAMINER

FREJD, RUSSELL WARREN

ART UNIT

PAPER NUMBER

2128

DATE MAILED: 12/13/2005

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/449,773	11/26/1999	SRIDHAR ADIBHATLA	13DV13092	6688

TITLE OF INVENTION: METHODS AND APPARATUS FOR MODEL BASED DIAGNOSTICS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$0	\$1400	03/13/2006

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

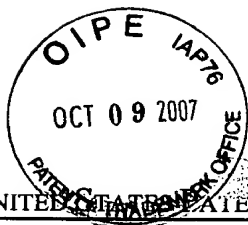
B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

OCT 11 2007
OCT 11 2007
Date: 12/19/05
By: Kelly
12729-77



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/449,773	11/26/1999	SRIDHAR ADIBHATLA	13DV13092	6688
29399	7590	12/13/2005		
JOHN S. BEULICK C/O ARMSTRONG TEASDALE LLP ONE METROPOLITAN SQUARE SUITE 2600 ST. LOUIS, MO 63102-2740			EXAMINER FREJD, RUSSELL WARREN	
			ART UNIT 2128	PAPER NUMBER

DATE MAILED: 12/13/2005

Determination of Patent Term Extension under 35 U.S.C. 154 (b)
(application filed after June 7, 1995 but prior to May 29, 2000)

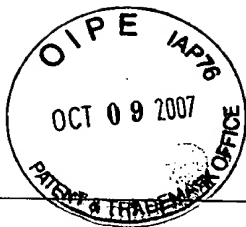
The Patent Term Extension is 0 day(s). Any patent to issue from the above-identified application will include an indication of the 0 day extension on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Extension is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571) 272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

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Notice of Allowability

Application No.

09/449,773

Examiner

Russell Frejd

Applicant(s)

ADIBHATLA ET AL.

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to applicant's amendment received 14 September 2005.

2. ☒ The allowed claim(s) is/are 1-5, 7-12 and 14-18.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413),

Paper No./Mail Date _____

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____

Russell Frejd
RUSSELL FREJD
PRIMARY EXAMINER

OCT 11 2007

Serial Number: 09/449,773

Page 1

In re Application of: Adibhatla et al.

Allowance of Application # 09/449,773

1. The following communication is in response to applicant's amendment received 14-September-2005.

Reasons for Allowance

2. The following is an Examiner's Statement of Reasons for the indication of allowable subject matter. The instant application is directed to a non-obvious improvement over the information described in the related prior art, specifically the article authored by Yu et al., the improvement comprising a system and method for monitoring engine performance, wherein engine operating conditions are supplied to an engine model and engine sensor values are supplied to an engine component quality estimator, and wherein a fault detection based on the outputs of the engine model and estimator is generated, whereby the estimator outputs are supplied to the engine model. This patentable distinction is included in each of the independent claims, nos. 1, 12, and 18. The art of record, either individually or in combination, fails to teach, suggest, or render obvious the useful, concrete and tangible <engine performance monitoring system> having the corresponding structure which is disclosed in the specification and equivalents thereof at least at page 2, line 16 through page 8, line 23, and Figures 1-7. In view of the foregoing, the claims of the present application are found to be patentable over the prior art.

OCT 11 2007

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Serial Number: 09/449,773

Page 2

In re Application of: Adibhatla et al.

Response Guidelines

3. Any comments considered necessary by applicant **MUST** be submitted no later than the payment of the Issue Fee and, to avoid processing delays, should preferably accompany the Issue Fee. Such submissions should clearly be labeled "Comments on Statement of Reasons for Allowance".

3.1 Any response to the Examiner in regard to this allowance should be

directed to: Russell Frejd, telephone number (571) 272-3779, Monday-Friday from 0530 to 1400 ET, or the examiner's supervisor, Kamini Shah, telephone number (571) 272-2279. Inquires of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist (571) 272-2100.

mailed to: Commissioner of Patents and Trademarks
P.O. Box 1450, Alexandria, VA 22313-1450

or faxed to: (571) 273-8300

Hand-delivered responses should be brought to the Customer Service Window, Randolph Building, 401 Dulany Street, Alexandria, VA, 22314.

Date: 28-November-2005

Russell Frejd

RUSSELL FREJD
PRIMARY EXAMINER

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ARMSTRONG TEASDALE LLP

One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
Phone: (314) 621-5070
Fax: (314) 621-5065
www.armstrongteasdale.com

Date: September 14, 2005

Please Deliver To:

Name: Examiner Russell Warren Frejd

Art Unit: 2128

Fax: 571-273-8300

Serial No. 09/449,773

Client/Matter #: 12729-77

From: Phillip A. Shipley

Total pages including cover page: 12

If all pages are not received, please contact Linda Johnson at ext. 7229

Facsimile Transmittal (1 pg.)

Track and Confirm (1 pg.)

Amendment with related documents as filed June 24, 2004 (10 pgs.)

Examiner Frejd,

Per our conversation, please note the attached.

Regards,

Phillip A. Shipley

The information contained in this facsimile message is information protected by attorney-client and/or the attorney/work product privilege. It is intended only for the use of the individual named above and the privileges are not waived by virtue of this having been sent by facsimile. If the person actually receiving this facsimile or any other reader of the facsimile is not the named recipient or the employee or agent responsible to deliver it to the named recipient, any use, dissemination, distribution, or copying of the communication is strictly prohibited. If you have received this communication in error, please immediately notify us by telephone and return the original message to us at the above address via U.S. Postal Service.

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PATENT
Attorney Docket No.: 13DV-13092

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Adibhatla et al.
Serial No.: 09/449,773
Filed: November 26, 1999
For: METHODS AND APPARATUS FOR
MODEL BASED DIAGNOSTICS

Group No.: 2128
Examiner: Frejd, Russell
Warren

Mail Stop: AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL

- Transmitted herewith is:
 - Amendment in Response to the Office Action dated March 24, 2004 (6 pgs.)
 - Amendment Transmittal (3 pgs., *in duplicate*)
 - Return post card

STATUS

- Applicant ☒ claims small entity status.
☐ is other than a small entity.

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. 1.8a)

I hereby certify that this correspondence is, on the date shown below, being:

MAILING
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Express Mail, Post Office to Addressee, Label No. EL
977937800 US, addressed to: Mail Stop:
AMENDMENT, Commissioner for Patents, P.O. Box
1450, Alexandria, VA 22313-1450.
Date: June 24, 2004

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Office


Robert B. Reedy, Reg. #5,548

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THE UNITED STATES PATENT OFFICE IS REQUESTED TO IMPRESS ITS
STAMP ON THIS CARD AND PLACE SAME IN THE OUTGOING MAIL TO
SHOW THE FOLLOWING PAPERS HAVE BEEN RECEIVED.

Atty Dkt. No.: 13DV-13092 (12729-77)

Inventors: Adibhatla et al.

Serial No.: 09/449,773

Filed: November 26, 1999

For: METHOD AND APPARATUS FOR MODEL BASED DIAGNOSTICS

Enclosed:

- Amendment in Response to the Office Action dated March 24, 2004 (6 pgs.)
- Amendment Transmittal (3 pgs., *in duplicate*)
- Return post card

RBR/ldd

Mailed: June 24, 2004

Express Mail No.: EL 977937800 US

EL 977937800US

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Entered into PAGE/PIPS

Date: 07/23/04

By: Am

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EXTENSION OF TERM

3. The proceedings herein are for a patent application and the provisions of 37 C.F.R. 1.136 apply.

(complete (a) or (b), as applicable)

- (a) _____ Applicant petitions for an extension of time under 37 C.F.R. 1.136
(Fees: 37 C.F.R. 1.17(a)-(d) for the total number of months checked below:)

Extension for response within:	Other than small entity Fee	Small entity Fee (if applicable)
_____ First month	\$ 110.00	\$ 55.00
_____ Second month	\$ 400.00	\$ 200.00
_____ Third month	\$ 920.00	\$ 460.00
_____ Fourth month	\$1,440.00	\$ 720.00
_____ Fifth month	\$1,960.00	\$ 980.00

Fee: \$ _____

If an additional extension of time is required, please consider this a petition therefor.

(Check and complete the next item, if applicable)

_____ An extension of _____ months has already been secured. The fee paid therefor \$ _____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request \$ _____.

OR

- (b) ☒ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

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FEE FOR CLAIMS

4. The fee for claims (37 C.F.R. 1.16(b)-(d)) has been calculated as shown below:

(Col. 1)		(Col. 2)	(Col. 3)	SMALL ENTITY		OTHER THAN SMALL ENTITY
CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA	ADDITIONAL RATE FEE	OR	ADDITIONAL RATE FEE
TOTAL	MINUS		=	x \$9 = \$		x \$18 = \$
INDEP.	MINUS		=	x \$42 = \$		x \$84 = \$
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				+ \$130 = \$		+ \$280 = \$
				TOTAL ADDITIONAL FEE \$	OR	TOTAL ADDITIONAL FEE \$

- (a) ☒ No additional fee for Claims is required

OR

- (b) ☐ Total additional fee for claims required \$

FEE PAYMENT

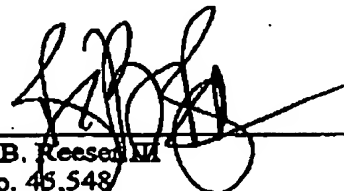
5. ☐ Attached is a check in the sum of \$
☐ Charge Deposit Account No. 01-2384 the sum of \$
 A duplicate of this transmittal is attached.

FEE DEFICIENCY

6. ☒ If any additional extension and/or fee is required, charge Deposit Account No. 01-2384.

AND/OR

- ☒ If any additional fee for claims is required, charge Deposit Account No. 01-2384.
7. ☐ Other:


 Robert B. Reeser
 Reg. No. 45,548
 ARMSTRONG TEASDALE LLP
 One Metropolitan Square, Suite 2600
 St. Louis, MO 63102
 314/621-5070

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13DV-13092
PATENT

IN THE CLAIMS

1. (currently amended) A system for monitoring engine performance, said system comprising:

an engine model;

a component quality estimator coupled to said engine model; and

a fault detection and isolation classifier coupled to said engine model and to said component quality estimator, said engine component quality estimator generates performance estimates, said model generates virtual parameters based on the performance estimates and engine operating conditions.

2. (original) A system in accordance with Claim 1 wherein said model comprises a component level model of an engine.

3. (original) A system in accordance with Claim 1 wherein said component quality estimator comprises a linear regressor.

4. (original) A system in accordance with Claim 1 wherein said fault detection and isolation classifier comprises a feed-forward neural network.

5. (original) A system in accordance with Claim 1 wherein said fault detection and isolation classifier comprises a linear regressor.

6. (canceled)

7. (currently amended) A system in accordance with Claim 6 1 wherein said fault 20 detection and isolation classifier identifies fault conditions based on said virtual parameters and engine sensor values.

8. (currently amended) A system in accordance with Claim 6 1 wherein said engine virtual parameters are subtracted from engine sensor values to generate sensor deltas supplied to said fault detection and isolation classifier.

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9. (original) A system in accordance with Claim 8 wherein reference sensor deltas are generated and are compared to later obtained sensor deltas to generate sensor delta-deltas supplied to said fault detection and isolation classifier.

10. (original) A system in accordance with Claim 1 wherein said model 5 generates virtual sensor values based on engine operating conditions, and said component quality estimator generates quality estimates based on said virtual sensor values and engine sensor values.

11. (original) A system in accordance with Claim 10 wherein said engine component quality estimator generates an initial quality estimate and a final quality estimates, and the initial and final quality estimates are compared to generate a delta quality supplied to said fault detection and isolation classifier.

12. (currently amended) A method for monitoring engine performance, said method comprising the steps of:

supplying engine operating conditions to an engine model;

supplying engine sensor values to an engine component quality estimator;

generating a fault detection based at least in part on engine model outputs, and at least in part on estimator outputs; and

supplying the estimator outputs to the engine model.

13. (canceled)

14. (currently amended) A method in accordance with Claim ~~13~~ 12 wherein the engine model generates sensor estimates, and said method further comprises the step of generating sensor deltas by comparing the sensor estimates to engine sensor values.

15. (original) A method in accordance with Claim 12 further comprising the step of supplying the engine model outputs to the engine component quality estimator.

16. (original) A method in accordance with Claim 15 further comprising the steps of:
operating the engine component quality estimator to generate an initial quality estimate and a final quality estimate; and

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PATENT

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SEP 14 2005

Applicant: Adibhatla et al.

Art Unit: 2128

Serial No.: 09/449,773

Examiner: Frejd, Russell W.

Filed: November 26, 1999

For: METHOD AND APPARATUS FOR MODEL BASED
DIAGNOSTICS

AMENDMENT

Mail Stop: AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated March 24, 2004, Applicants respectfully request consideration and entry of the following amendment.

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09/14/2005 08:15 FAX 3146215065

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13DV-13092
PATENT

comparing the initial quality estimate to the final quality estimate to generate a delta quality.

17. (currently amended) A method in accordance with Claim ~~13~~ 12 wherein the engine model generates sensor estimates, and said method further comprises the steps of:

generating a reference sensor delta by comparing the sensor estimates at a first operating point;

generating a current sensor delta at a second operating point; and

generating a sensor delta-delta by comparing the reference sensor delta to the current sensor delta.

18. (original) A method for monitoring engine performance, said method comprising the steps of:

generating a reference sensor delta by comparing sensor values with sensor estimates at a first operating point;

generating a current sensor delta at a second operating point;

generating a sensor delta-delta by comparing the reference sensor delta to the current sensor delta; and

generating a fault detection based upon the sensor delta-deltas.

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Express Mail No EL 9-937800 US

13DV-13092
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REMARKS

The Office Action mailed March 24, 2004, has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-5, 7-12, and 14-18 are now pending in this application. Claims 1, 2, and 12 stand rejected. Claims 3-11 and 13-17 are objected to. Claims 6 and 13 have been canceled. Claim 18 is allowed.

The rejection of Claims 1, 2, and 12 under 35 U.S.C. § 102(e) as being anticipated by the article authored by Yu et al., entitled *A Floating Point Co-Processor for Real-Time Fault Detection and Isolation in Electronically Controlled IC Engines* is respectfully traversed.

Claim 6 was indicated as being allowable if rewritten in independent form including the limitations of the base claim. Claim 6 has been cancelled and independent Claim 1 has been amended to include all of the recitations of Claim 6. Claim 1 is therefore submitted to be patentable over Yu et al.

Claim 2 depends from independent Claim 1. When the recitations of Claim 2 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claim 2 likewise is patentable over Yu et al.

Claim 13 was indicated as being allowable if rewritten in independent form including the limitations of the base claim. Claim 13 has been cancelled and independent Claim 12 has been amended to include all of the recitations of Claim 13. Claim 12 is therefore submitted to be patentable over Yu et al.

For the reasons set forth above, Applicants respectfully request that the Section 102(e) rejection of Claims 1, 2, and 12 be canceled.

Claims 3-11 and 13-17 were indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 6 has been canceled, and independent Claim 1 has been amended to include all of the recitations from Claim 6. Claim 1 is therefore submitted to be in condition for allowance.

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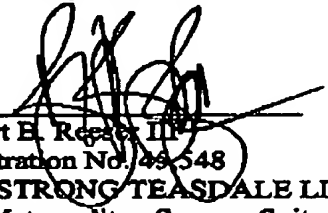
Claims 2-5 and 7-11 depend from independent Claim 1. When the recitations of Claims 2-5 and 7-11 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-5 and 7-11 likewise are in condition for allowance.

Claim 13 has been canceled, and independent Claim 12 has been amended to include all of the recitations from Claim 13. Claim 12 is therefore submitted to be in condition for allowance.

Claims 14-17 depend from independent Claim 12. When the recitations of Claims 14-17 are considered in combination with the recitations of Claim 12, Applicants submit that dependent Claims 14-17 likewise are in condition for allowance.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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1, 12, 18

PATENT APPLICATION FEE DETERMINATION RECORD Effective November 10, 1998				Application or Docket Number 09/449773			
CLAIMS AS FILED - PART I							
		(Column 1)			(Column 2)		
FOR		NUMBER FILED		NUMBER EXTRA			
BASIC FEE							
TOTAL CLAIMS		18	minus 20=				
INDEPENDENT CLAIMS		3	minus 3 =				
MULTIPLE DEPENDENT CLAIM PRESENT N							
* If the difference in column 1 is less than zero, enter "0" in column 2							
CLAIMS AS AMENDED - PART II							
		(Column 1)			(Column 2)		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA	
	Total	17	Minus	20			
	Independent	3	Minus	3			
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM						
		(Column 1)			(Column 2)		
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA	
	Total		Minus				
	Independent		Minus				
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM						
		(Column 1)			(Column 2)		
AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA	
	Total		Minus				
	Independent		Minus				
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM						
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>							

SMALL ENTITY TYPE ☐ OR **OTHER THAN SMALL ENTITY**

RATE	FEE		RATE	FEE
	380.00	OR		760.00
X\$ 9=		OR	X\$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL		OR	TOTAL	

SMALL ENTITY TYPE ☐ OR **OTHER THAN SMALL ENTITY**

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

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Attorney Docket No.: 13DV-13092

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Adibhatla et al.

Serial No.: 09/449,773

Filed: November 26, 1999

For: METHODS AND APPARATUS FOR
MODEL BASED DIAGNOSTICS

Group No.: 2128

Examiner: Frejd, Russell
Warren

Mail Stop: AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL

- Transmitted herewith is:
 - Amendment in Response to the Office Action dated March 24, 2004 (6 pgs.)
 - Amendment Transmittal (3 pgs., *in duplicate*)
 - Return post card

STATUS

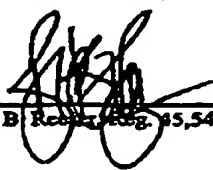
- Applicant ☒ claims small entity status.
☐ is other than a small entity.

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. 1.8a)

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1450, Alexandria, VA 22313-1450.
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FEE FOR CLAIMS

4. The fee for claims (37 C.F.R. 1.16(b)-(d)) has been calculated as shown below:

	(Col. 1) CLAIMS REMAINING AFTER AMENDMENT	(Col. 2) HIGHEST NO. PREVIOUSLY PAID FOR	(Col. 3) PRESENT EXTRA	SMALL ENTITY ADDITIONAL RATE FEE	OR	OTHER THAN SMALL ENTITY ADDITIONAL RATE FEE
TOTAL	MINUS		=	x \$9 = \$		x \$18 = \$
INDEF.	MINUS		=	x \$42 = \$		x \$84 = \$
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				+ \$130 = \$		+ \$260 = \$
				TOTAL ADDITIONAL FEE \$	OR	TOTAL ADDITIONAL FEE \$

- (a) ☒ No additional fee for Claims is required

OR

- (b) ☐ Total additional fee for claims required \$

FEE PAYMENT

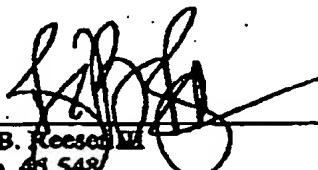
5. ☐ Attached is a check in the sum of \$
☐ Charge Deposit Account No. 01-2384 the sum of \$
☐ A duplicate of this transmittal is attached.

FEE DEFICIENCY

6. ☒ If any additional extension and/or fee is required, charge Deposit Account No. 01-2384.

AND/OR

- ☒ If any additional fee for claims is required, charge Deposit Account No. 01-2384.
 7. ☐ Other:


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